

Post-doctoral position at CEREGE (Aix-en-Provence) and ALLIOS (Marseille)

Safe by design functional coating for interior and exterior with enhance radiation efficiency: a way to save building energy

WARM-ECOPAINT

In recent years, interior design practice has seen a dramatic shift with design strategies that now focus on providing healthy and sustainable environments for individual's to live, work and play in. Customers are beginning to understand their impact on the environment. The customer awareness is even not limited to interiors design and can be included in the general concept of Net Zero Energy Buildings (NZEBs) concept.

Energy (heat) saving can be achieved by using a large range of materials used both inside and on the outer shell of buildings. Efficient heat insulator materials are developed to reduce mainly thermal conductivity of walls. Heat insulation can also be achieved by selectively managing the radiation. Indeed, heat transfer not only occurs via conduction and convection but also with radiation.

Infrared reflective materials can participate to the decrease of energy cost whether used on the inner surface of wall to avoid heat release in winter or on the outer surface of building to decrease the need of air conditioning in summer.

The Post-doctoral fellow will develop, using a safer by design approach, functional coating for interior and exterior with enhance radiation efficiency based on previous R&D Allios studies. The IR screen effect will be improved by optimizing the size, shape and surface chemistry of spinel oxides for inside and outside coatings. The dispersion of the (nano)-particles within the coating will represent a key issue to enhance IR reflectance efficiency as well as the increase of coating durability. The dispersion will be characterized using micro and nano X-ray computed tomography (micro and nano-CT) and small angle X-ray scattering (SAXS). The coating

and paint will be aged using climatic chamber specifically adapted to reproduce interior UV effect and moisture (condensation).

The candidate must hold a PhD thesis preferably in material sciences, mineralogy, and / Or organic chemistry with a good record of publications in relationship with the targeted field of activities. The Post Doctorate candidate must be highly dynamic, sociable, feel comfortable to speak and write in English, be very autonomous and strongly motivated by collaborative and collective works.

The position is requested to perform the coating synthesis and the characterisation of the IR reflectivity. ALLIOS has already developed the methodology for both production and characterisation of the various requested coating properties.

Location: CEREGE in Aix-en-Provence, France.

Duration of contract: 24 months
Starting date: January 2019

Contact: Jérôme Rose (rose@cerege.fr) / Gregory Brochard (gregory.brochard@allios.fr)

Applications must be submitted in English by email:

- a Curriculum Vitae (2 pages max)
- a list of publications
- a cover letter (1 page)

Closing date for applications: 24th July 2019